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TIME SERIES ANALYSIS OF PHILIPPINE
RICE PRODUCTION

SPECIAL PROBLEM

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COLLEGE OF ARTS AND SCIENCES
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April 2003

**TIME SERIES ANALYSIS OF PHILIPPINE
RICE PRODUCTION**

**A Special Problem
Submitted to the Faculty of the
Cavite State University
Indang, Cavite**

**In partial fulfillment
of the requirements for the degree of
Bachelor of Science in Applied Mathematics
(with specialization in Statistics)**



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ABSTRACT

ESTRADA, ANDREA DIONISIO. “ **Time Series Analysis of Philippine Rice Production**”. Bachelor of Science in Applied Mathematics. Cavite State University, Indang, Cavite, April 2002. Adviser: Mr. Antonio V. Cinto.

The study entitled “Time Series Analysis of Philippine Rice Production” was conducted at the Physical Sciences Department, College of Arts and Sciences, Cavite State University, Indang, Cavite, from January to February 2002 to: 1) determine a model that could be used in forecasting the rice production of the Philippines; 2) provide a forecast of the Philippine rice production from 2002 to 2005; and 3) test the accuracy of the formulated model.

The yearly series data of the country’s rice production was obtained from the Provincial Agricultural Office in Trece Martires City, Cavite and Bureau of Agricultural Statistics of the Department of Agriculture in Quezon City.

Three models were formulated in this study. To select the best model that will predict the Philippine rice production from 2002 to 2005, the following criteria were considered: R-squared; adjusted R-squared; standard error of regression; sum of squared residual; Durbin-Watson statistic; Akaike Information Criterion (AIC) and Shwarz Bayesian Criterion (SBC).

Forecasted values from the year 2002 to 2005 were computed using the formulated model ARMA (1, 2) with the equation:

$$y_t = y_{t-1} - 0.60y_{t-4} + 0.60y_{t-5} + 0.73e_{t-1} - 0.54e_{t-4} + e_t$$

The forecasted rice production for the year 2002 to 2005 followed an inconsistent trend. In the end of the year 2002, the rice production was approximated to be 7,981,579

metric tons; 6,963,561 metric tons in 2003; 7,577,385 metric tons in 2004; and 7,377,784 metric tons in year 2005.

The forecast accuracy was also tested using the Mean Absolute Percentage Error (MAPE) method. The MAPE results showed that there was a small standard error indicating that the forecasted values were reliable.

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TIME SERIES ANALYSIS OF PHILIPPINE

RICE PRODUCTION ^{1/}

Andrea D. Estrada

^{1/}A special problem presented to the faculty of the Department of Physical Sciences, College of Arts and Sciences, Cavite State University, Indang, Cavite in partial fulfillment of the requirements for the degree of Bachelor of Science in Applied Mathematics with specialization in Statistics. Prepared under the supervision of Mr. Antonio V. Cinto.

INTRODUCTION

Rice is one of the most important food crops not only in the Philippines but also in the world. It is a dominant agricultural product, foodstuff, source of employment, and, in the early stages of development at least, foreign exchange earner, and will continue to contribute to the rate of economic development of the country. The availability of an adequate supply of rice means more than simply providing for people's nutritional needs.

Rice mainly contribute to the country's development by supplying the major staple food of the Filipino people; providing the major source of income to enable rural people to effectively demand goods produced in other sectors of the economy; providing an investible surplus of savings and taxes to support investment in other expanding sectors; and reducing foreign exchange constraints by increasing exports or by saving foreign exchange through import substitution, since rice is one of the most major products being marketed by the country (IRRI, 1982).